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the latter 2,000,000 are in the Khanate of Bokhara, the remainder in Khiva and Afghan Turkistan.

The Proceedings of the Royal Geog. Soc., May 1888, contains a map of Mr. F. C. Selous' explorations in the Matabele and Mashuna countries, giving the routes of the various rivers and the position of the hill ranges with greater accuracy than any other previous map.

The death is announced of the celebrated Russian, Nicholas von Miklucho-Maclay, whose name has so long been prominent in connection with explorations in New Guinea. His residence in that country impaired his health, and in 1882 he returned to Russia. After this he resided awhile in Sydney (Australia) where he founded a biological station, and then again returned to Russia, where he resided at the time of his death, at the age of forty-two years.

GEOLOGY AND PALÆONTOLOGY.

Geological News.—Silurian, etc.—Dr. John Walther, in his researches into the structure of the crinoids (Palæontographica, Band 32), traces the entire group to a bilateral ancestral form, represented by the Pelmatozoa of the Pre-Cambrian, and considers the Ateleocystites of the Lower Silurian as a reversion to this ancestral and larval form. This is followed by an "acyclical" holosymmetrical form, exemplified by Macrocystella, the oldest Cambrian Pelmatozoan. From this form two series arise—on one hand, the Cystoids, on the other, the Crinoidea.

Devonian.—M. Maurice Gordon has discovered in the Valley of l'Arboust, in the Pyrenees, a schistose deposit with trilobites which are entirely new to the French fauna and ascend to an epoch that has recently been studied between the Hartz and the Ural. These trilobites include two new species of Bronteus and one each of Dalmanites, Lichas, Cyphaspis, and Harpes. M. Chas. Barrois states that the fauna is more recent than the Silurian stage of Bohemia and older than the Coblencian stage of the Devonian.

M. Chas. Barrois has identified twenty-eight species of crinoids, brachiopods, trilobites, etc., occurring in the singular sedimentary limestone of the quarry of Vallet, near Chaudefonds (France). Though this thin bed is certainly Devonian, it has not yet been correlated with the other Devonian bands of the region, but seems to form an islet in the midst of red and green schists, which are by some referred to the Lower Silurian, by others to the Upper Devonian, or even to the Carboniferous. The trilobites are Silurian, but the brachiopods and crinoids are Devonian, and the fossils, as a whole, are referred by M. Barrois to the same horizon with the Eifelian beds of the Rhine.

The coral limestone of Cabrieres (Herault, France) is by M. Barrois ranged between the Eifelian and the Coblencian stages of the Devonian.

CARBONIFEROUS.—*Spirodomus insignis,* is a peculiar, spirally-twisted lamellibranch, recently described by Chas. E. Beecher, from the attenuated Waverly series of northwestern Pennsylvania. In its reflexed and minutely plicated margins and absence of proper hinge, this shell suggests some forms of Pholas, and its spiral form seems to indicate a burrowing habit.

Among the impressions of fishes collected in the shales of the coal-beds of Commentry are some with a cartilaginous skeleton ossified at certain points and presenting peculiarities not to be found in any other living or extinct fish. The study of twenty-three examples of this fish, some of them in a good state of preservation, has enabled M. Brongniart to describe it under the name of *Pleuracanthus gaudryi.* In form this fish resembles a shark, and in length it varies from eighteen to forty inches.

JURASSIC.—Dr. E. Fraas (Palæontographica, Band 32) treats of the asteriads of the White Jura of Swabia and Franconia, with researches into the structure of echinoderms and the skeleton of the Asteroidea. He describes as new *Astropecten infirmum* and *A. elegans;* also *Pentacerus pustuliferus,* from the lithographic schists of Kelheim.

E. Koken (Palæont. Abhandl., 1887) has contributed additional information upon the Dinosauria, Crocodilia, and Sauropterygia of the Wealden of Northern Germany. Among the crocodiles, *Goniopholis pugnax* and *G. minor,* and among the Sauropterygia, *Plesiosaurus degenhardti, Pl. limnophilus,* and a third unnamed Plesiosaurus, are new. The work also contains much information upon the development of the brain and auditory passages of the genus Macrorhynchus.

CRETACEOUS.—*Gigantichthys pharao* is the name given to a fossil fish of the family Trichiuridæ, collected by Professor Schweinfurth in the cretaceous beds of Egypt, within ten kilometres of the Pyramids of Gizeh.

CÆNOZOIC.—Dr. O. Roger concludes (Ueber *Dinotherium bavaricum,* Palæontographica, Band 32) that *D. bavaricum* is the smaller, older ancestral form, contemporary with Anchitherium, out of which, by a series of transitional forms, the gigantic *Din. giganteum* was finally developed in the Hipparion period.

In 1885 Professor M. Neumayr and Dr. L. v. Tausch undertook explorations in the Pliocene beds of Pikermi, near Athens, for the benefit of the Vienna Museum, and the result of their work has been to considerably widen our knowledge of that rich fauna. Dr. A. Weithofer describes as new *Mustela palæattica, Machairodus schlosseri, Camelopardalis parva, Helicoceras rotundicorne,* and *Varanus marathonensis,* and mentions some avian remains of as yet undetermined forms, two of which seem to belong to the genus Gallus. A species of Felis, mentioned but not described by Gaudry in 1862 as at least equal in size to the largest jaguar, is by Dr. Weithofer described as *F. leiodon. Helicoceras rotundicorne* is a gazelle-like antelope with rather large and spiral horns.

A. S. Woodward (*Geol. Mag.*, July, 1887) describes *Arius egertoni* and *A.* (?) *bartonensis,* two forms of siluroids from the Middle and Upper Eocene beds of Bracklesham and Barton (England).

Van Beneden (*Zeitschr. deutsch. geol., Ges.* 1887) has described Cetacean remains from the northern slopes of the Caucasus. These remains probably belong to the genera Squalodon and Cetotherium. The age is Upper Miocene.

PLEISTOCENE.—The exploration of the caves in the Karnul district of Madras, conducted by Mr. R. B. Foote, has resulted in the finding of about forty species of Mammalia, of which Mr. R. Lydekker (Mem. Geol. Surv., India, Ser. X., Vol. IV., Pt. 2) describes as new *Viverra karnuliensis, Hystrix crassidens, Atherura karnuliensis, Rhinoceros karnuliensis,* and *Sus karnuliensis.* The most important of the Karnul caves are those of Billa Surgam, which consist of three short and deep cañons joined by natural arches, and with caves opening into them at various levels. The comparatively large number of extinct forms and forms not now to be found in India that occur in these deposits renders it probable that they are not newer than the Pleistocene, and Mr. Lydekker refers them to the later part of the Narbada period. The most remarkable features of the list are the occurrence of a Cynocephalus which may be identical with a living African species; of *Hyæna crocuta;* of a small Equus indistinguishable from *E. asinus,* and of a Manis, apparently identical with the existing West African *M. gigantea;* while the occurrence of a peculiar species of Rhinoceros and of a Hystrix and a Viverra specifically distinct from those now living in India, as well as of the non-Indian genus Atherura, is scarcely less noteworthy. The evidence afforded by this cave-fauna strengthens that afforded by the Siwaliks as to the probable derivation of many of the existing Ethiopian mammals from those of the later tertiaries of India.

Drs. L. Doderlein and E. Schumacher describe, in a bulletin of the Geological Survey of Alsace-Lorraine, a rich diluvial mammalian fauna that has been recently found at Voklinshofen, near Colmar. Twenty-nine forms are listed, most of them large and mostly extinct in Alsace, though many occur in northern Europe or in the Alps.